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# **ADAM AND EVE:**

## Fact or Fiction?



# When Did God Create Adam and Eve?

- Dr. Hugh Ross

No matter where I speak in the world, people in my audiences press me for a precise date for God creating the first human beings, Adam and Eve. Seeing how disappointed they are when I tell them that neither the Bible nor science offers an exact date gives me some understanding of why Archbishop James Ussher and Reverend John Lightfoot felt compelled to calculate, to the day and the hour, the timing of God's creation of Adam and Eve.

## Best Biblical Dates for Adam and Eve

Using the numbers associated with the genealogies in Genesis, Exodus, Kings, and Chronicles, Ussher and Lightfoot determined that Adam was created on October 23 at 9 AM, 45th meridian time, in 4004 BC. Their determination presumed that these genealogies were exhaustive—with no generations missing. A wealth of biblical scholarship proves otherwise.<sup>1</sup>

Though the biblical genealogies offer little help in establishing Adam's creation date, three other biblical clues do. First, Genesis 10:25 states that the world was divided in the time of Peleg. Given the context of God scattering humanity over the whole face of Earth, this statement probably refers to the time when the Bering Land Bridge became the Bering Strait. Reliable carbon-14 dating places this event at 11,000 years ago. This date implies that the worldwide scattering of humanity must have predated 9000 BC and that Noah's flood must've occurred before 9000 BC. The creation of Adam would have occurred much earlier yet.

Second, Genesis 2 describes four known rivers flowing out from named locations—in the mountains of Arabia and the mountains surrounding Mesopotamia—and meeting together in the Garden of Eden. (Adam was placed in Eden shortly after he was created, and Eve was created in Eden.) The only time these rivers can join together on dry land is when most of the Persian Gulf is dry.<sup>2</sup> The drying up of most of the Persian Gulf requires that Earth be in an ice age. The last ice age persisted from 120,000 to 13,000 years ago and the ice age before that from 135,000 to 230,000 years ago.

Third, the earliest archaeological evidence for human activity appears in both the Persian Gulf region and in east and southern Africa. This evidence implies an easy migration route between the Persian Gulf region and east and southern Africa. This route took the form of lush growth along the Gihon River through southern Arabia and a land bridge connecting the southwestern part of Arabia to the Horn of Africa. Such a migration route existed three times during the last two ice ages: 55,000, 75,000–130,000, and 150,000–160,000 years ago.<sup>3</sup> It was most favorable for human migration during the first two of the three epochs.

The most likely biblical date for the creation of Adam and Eve, therefore, would lie between 55,000 and 120,000 years ago. However, the date could be stretched as far back as 230,000 years ago.

### Best Scientific Dates for Adam and Eve

The earliest undisputed evidence for human industry comes from carbon-14 dates establishing that humans used tools to grind roasted grains into flour at least as long as  $32,614 \pm 425$  years ago.<sup>4</sup> The earliest undisputed evidence for symbolic expression and advanced art dates back to 36,000 years ago.<sup>5</sup> The earliest undisputed evidence for rapidly advancing tool technology and the manufacture and use of clothing and jewelry dates back to 40,000–45,000 years ago. Thermal and optical luminescence dating techniques indicate that jewelry and art pigments were being used by humans 70,000–80,000 years ago and even as far back as 165,000 years ago.<sup>6</sup> However, thermal and optical luminescence dating can only be trusted to yield upper limits—that is, the dates could indicate more recent times.

The latest genetic dates for mitochondrial Eve range from 107,000 to 197,000 years ago.<sup>7</sup> The latest genetic dates for Y-chromosomal Adam range from 101,000 to 200,000 years ago.<sup>8</sup> The reason these genetic dates are in such discord is that they presume different molecular clock rates. Molecular clocks, however, are notoriously unreliable timekeepers.<sup>9</sup>

The best available science places the origin of humanity previous to 45,000 years ago. However, scientifically, the origin of human beings could date as early as 200,000 years ago.

The uncertainties in both the biblical and scientific dates are numerous. Furthermore, it's unlikely that future biblical and scientific research efforts will ever reduce the uncertainties. Fundamental barriers prevent us from achieving significantly better dates. However, what's most encouraging for the Christian faith is that the biblical and scientific dates agree.

### Endnotes

1. Hugh Ross, *A Matter of Days: Resolving a Creation Controversy* (Covina, CA: RTB Press, 2015), 237–238.
2. Hugh Ross, *Navigating Genesis: A Scientist's Guide to Genesis 1–11* (Covina, CA: RTB Press, 2014), 96–100.
3. Ash Parton et al., “[Alluvial Fan Records from Southeast Arabia Reveal Multiple Windows for Human Dispersal](#),” *Geology* 43, no. 4 (February 2015): 295–298, doi:10.1130/G36401.1; Hugh Ross, “[Did Arabia Provide a Migration Route for Early Humans?](#),” *Today's New Reason to Believe* (blog), Reasons to Believe, May 28, 2015.
4. Marta Mariotti Lippi et al., “[Multistep Food Plant Processing at Grotta Paglicci \(Southern Italy\) around 32,600 Cal B.P.](#),” *Proceedings of the National Academy of Sciences, USA* 112, no. 39 (September 8, 2015): 12075–12080, doi:10.1073/pnas.1505213112.
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6. Chris Stringer, *Lone Survivors: How We Came to Be the Only Humans on Earth* (New York: Times Books, 2012), 108–141; Marian Vanhaeren et al., “[Middle Paleolithic Shell Beads in Israel and Algeria](#),” *Science* 312, no. 5781 (June 23, 2006): 1785–1788, doi:10.1126/science.1128139; Curtis W. Marean et al., “[Early Human Use of Marine Resources and Pigment in South Africa during the Middle Pleistocene](#),” *Nature* 449 (October 18, 2007): 905–908, doi:10.1038/nature06204.
7. Fazale Rana with Hugh Ross, *Who Was Adam? A Creation Model Approach to the Origin of Humanity*, 2nd ed. (Covina, CA: RTB Press, 2015), 265–266.
8. Rana with Ross, *Who Was Adam?*, 267–288.
9. Hugh Ross, *Improbable Planet: How Earth Became Humanity's Home* (Grand Rapids, MI: Baker Books, 2016), 178.



# Were They Real? The Scientific Case for Adam and Eve

- Dr. Fazale Rana

Did Adam and Eve really exist? Did all humanity originate from a single pair? These questions aren't peripheral topics for an academic debate; they're central to the Christian faith.

Toward this end, recent advances in molecular genetics are quite provocative. As Hugh Ross and I discuss in, numerous studies indicate that humanity originated: (1) recently (around 100,000 years ago, plus or minus 20,000 years or so); (2) at a single location (East Africa)—close to where some Bible scholars think the Garden of Eden was located; and (3) from a small population of individuals.

Moreover, analysis of mitochondrial DNA (which provides insight into the origin of the maternal lineage) indicates that humanity traces back to a single ancestral sequence that could be interpreted as a single woman. Likewise, characterization of Y-chromosomal DNA (which provides insight into the origin of the paternal lineage) indicates that all men trace their origin back to a single ancestral sequence that could be interpreted as a single man.

These astounding results harmonize with a traditional reading of the biblical account of human origins, which suggests that Adam and Eve likely existed as real persons who gave rise to all of humanity.

### But Did Adam and Eve Exist?

Others have challenged this interpretation that Adam and Eve gave rise to humanity, arguing that the genetic data shows that humanity arose from thousands of individuals, not two.<sup>1</sup> The chief basis for this claim comes from estimates of the ancestral population size of humans based on genetic diversity.

It's possible to estimate the effective population size of any ancestral group from genetic diversity of present-day populations if the mutation rate is known. As discussed in *Who Was Adam?*, a number of these types of studies do indeed indicate that humans stem from a small population, on the order of a few hundred to a few thousand.<sup>2</sup>

Skeptics of the traditional reading of the biblical account of human origins accept these results. They argue that the data indicate humanity experienced a genetic bottleneck, with the population collapsing to a relatively small number of individuals. Consequently, humanity arose from the thousands of survivors, not a primeval pair.

Critics also point to other methods to model the ancestral population size that do not depend on mutations but on other types of processes to generate genetic diversity.<sup>3</sup> Studies employing these techniques also seem to indicate that humanity arose from population sizes on the order of a few thousand individuals.

### What Was the Population Size, Really?

In the face of this challenge, it's important to recognize that population sizes generated by these methods are merely estimates, not hard and fast values. The reason: The mathematical models are highly idealized, generating differing estimates based on a number of factors. As a case in point, consider two studies discussed in *Who Was Adam?*. One examined DNA sequence elements called short tandem repeats at 377 locations in the human genome for 1,056 individuals who represented 52 population groups. On the basis of this analysis, they concluded that humanity originated from a single point of origin (apparently Africa), from a small population (~2,000 or fewer) between 71,000 and 142,000 years ago.<sup>4</sup> Although this conclusion was consistent with that of an earlier study of short tandem repeats, the population size estimate from the earlier study was around 500 individuals.<sup>5</sup> The reason for the difference (of about 1,500) was due to varying sample sizes and the number of locations in the human genome that were studied.

Did humanity originate from a single pair? Even though population estimates reveal that humanity originated from several hundred to several thousand individuals based on mathematical models, it could well be the case that these models overestimate the original numbers for the first humans.

And it's important to note that an origin of humanity from a small population is consistent with the existence of a historical Adam and Eve who gave rise to all of humanity. After their creation the biblical text teaches that they procreated—having many sons and daughters (Genesis 5:4). Given the limitations of the methods to estimate population size, could it be that the population estimates are reporting on the population structure of humans sometime after their creation when the population would've been small, on the order of a few thousand? Additionally, skeptics who claim that humanity came from thousands of individuals (not two) assume that Adam and Eve were genetically identical. Yet, there's no hint of that idea in Scripture. When Eve is created, God takes material from Adam's side and *rebuilds* (*bānâ* in the original Hebrew) it. Part of this process could've involved the introduction of genetic differences into Eve's genome that made Adam and Eve genetically heterogeneous.

If natural selection drove an increase in genetic diversity in humans—as a research team claims it did with mouflon sheep—then the estimates of the original population sizes of humanity would be artificially high.

### Are We All Like Sheep?

In 2007 a research team reported on the genetic diversity of wild mouflon sheep on one of the islands that are part of the Kerguelen sub-Antarctic archipelago.<sup>6</sup> This group of sheep provided researchers with an unprecedented opportunity to study the effects of population dynamics on genetic diversity in small populations.

In 1957 a male and female yearling were placed onto Île Haute (one of the Kerguelen Islands). These two sheep were taken from a captive population in France. By the beginning of the 1970s, the population had grown to 100 sheep and peaked at 700 by 1977. Since that time the population has fluctuated in a cyclical manner between 250 and 700 members. Given that the population began with only two individuals (the founder effect), had experienced cyclical changes in the population size, and was isolated on an island, the researchers expected very low genetic diversity (measured as heterozygosity).

Using mathematical models, the heterozygosity of a population can be computed at any point in time from the heterozygosity of the ancestral population (which was known for the original mouflon pair) and the original population size. What the researchers discovered, however, when they measured this quantity directly for the sheep on Île Haute was that it exceeded the model's predictions by up to a factor of 4. In other words, the models underestimated the genetic diversity of the actual population.

The researchers explained this discrepancy by speculating that natural selection drives the increase in genetic diversity, since an increase in genetic variability increases the survivability of the population.

Consequently, if these same models were used to estimate the effective sizes of the ancestral population from the measured genetic diversity at any point in time, they would've overestimated the original population size as much larger than two individuals.

Lastly, the primary reason to think that humanity arose from a single pair doesn't rest on population estimates but on the fact that the Y-chromosomal and mitochondrial DNA sequences sampled from humans alive today trace back to single ancestral sequences. Again, these can be understood as reflecting an origin from a single man and a single woman.

### One Lucky Father and Mother?

Even though the genetic data traces humanity's origin back to a single woman and a single man, evolutionary biologists are quick to assert that Y-chromosomal Adam and mitochondrial Eve weren't the first humans. Rather, according to them, many "Adams" and "Eves" existed.<sup>7</sup> The pair named Y-chromosomal Adam and mitochondrial Eve just happened to be the lucky ones whose genetic material survived. The genetic lines of the other first humans were lost over time.

While this explanation isn't out of the realm of possibility, it's highly contrived. It would work if only a few of the first humans reproduced. If the data is simply taken at face value, the biblical model is the more rational explanation.

Even though evolutionary biologists offer ways to explain away the implications of the human population genetic data, these explanations—entrenched in naturalism—aren't necessarily superior to an interpretation that fully squares with the biblical account. The scientific case for the biblical Adam and Eve stands firm.

### Endnotes

1. For example see the blog entry by Dennis Venema and Darrel Falk, [Adam, Eve, and Human Population Genetics: Responses to Popular Arguments](#) (Nov 24th, 2014)
2. "The Biologos Forum," accessed September 17, 2010.
3. Fazale Rana with Hugh Ross, [Who Was Adam? A Creation Model Approach to the Origin of Humanity](#) (Colorado Springs, CO: NavPress, 2005), 55–75.
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5. Lev A. Zhivotovsky, Noah A. Rosenberg, and Marcus W. Feldman, "[Features of Evolution and Expansion of Modern Humans, Inferred from Genomewide Microsatellite Markers](#)," *American Journal of Human Genetics* 72, no. 5 (May 2003): 1171–1186, doi:10.1086/375120.
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